

We claim:

1. A method for mobile communication roaming where a subscriber's home network and the roaming network used by the subscriber do not have a roaming agreement, the method comprising:

- sending a "Send Authentication/Parameters" request from a roaming network to a central system;

- sending the "Send Authentication/Parameters" request from the central system to an alliance network;

- sending the "Send Authentication/Parameters" request from the alliance network to a roaming gateway;

- sending the "Send Authentication/Parameters" request from the roaming gateway to the home network;

- sending an authentication response to the "Send Authentication/Parameters" request from the home network to the roaming network via the roaming gateway, alliance network, and central system;

- sending a "Update Location" request from the roaming network to the central system;

- replacing the visitor locator register (VLR) address in the "Update Location" request with the VLR address of the central system to create a modified update request;

- sending the modified update request from the central system to the alliance network;

- sending the modified update request from the alliance network to the roaming gateway;

- replacing the visitor locator register (VLR) address in the modified update request with the VLR address of the roaming gateway to create a twice modified update request;

- sending the twice modified update request from the roaming gateway to the home network; and

- sending an update response to the twice modified update request from the home network to the roaming network via the roaming gateway, alliance network, and central system.

2. The method of claim 1 further comprising:

placing a call by the subscriber.

3. The method of claim 1 further comprising:  
sending a SMS message by the subscriber.
4. The method of claim 1 further comprising:  
receiving an incoming call for the subscriber by the home network;  
sending a "Provide Roaming Number" request from the home network to the roaming gateway;  
sending a "Provide Roaming Number" request from the roaming gateway, acting as a home locator register(HLR), to the alliance network;  
sending the "Provide Roaming Number" request from the alliance network to the central system;  
sending the "Provide Roaming Number" request from the central system, acting as HLR, to the roaming network;  
sending a provide number response to the "Provide Roaming Number" request from the roaming network to the home network via the central system, alliance network, and roaming gateway; and  
connecting the subscriber to the in coming call.
5. The method of claim 1 further comprising:  
receiving an incoming SMS message for the subscriber by the home network;  
sending a "MT Forward SM" request from the home network to the roaming gateway;  
sending a "MT Forward SM" request from the roaming gateway, acting as home locator register(HLR), to the alliance network;  
sending the "MT Forward SM" request from the alliance network to the central system;  
sending the "MT Forward SM" request from the central system, acting as HLR to the roaming network;  
delivering the SMS message to the subscriber; and

sending an SMS response to the "MT Forward SM" request from the roaming network to the home network via the central system, alliance network, and roaming gateway.

6. A method for mobile communication roaming where a subscribers home network and the roaming network used by the subscriber do not have a roaming agreement, the method comprising:

- replacing the subscriber's primary IMSI with a secondary IMSI on a mobile communication device;

- sending a "Send Authentication/Parameters" request, based on the secondary IMSI, from the roaming network to the roaming gateway;

- sending the "Send Authentication/Parameters" request from the roaming gateway to an alliance network;

- sending the "Send Authentication/Parameters" request from the alliance network to a central system;

- replacing the secondary IMSI with the primary IMSI in the "Send Authentication/Parameters" request;

- sending the "Send Authentication/Parameters" request from the central system to the home network;

- sending an authentication response to the "Send Authentication/Parameters" request from the home network to the roaming network via the central system, alliance network, and roaming gateway;

- sending a "Update Location" request from the roaming network to the roaming gateway;

- replacing the visitor locator register (VLR) address in the "Update Location" request with the VLR address of the roaming gateway to create a modified update request;

- sending the modified update request from the roaming gateway to the alliance network;

- sending the modified update request from the alliance network to the central system;

- replacing the visitor locator register (VLR) address in the modified update request with the VLR address of the central system to create a twice modified update request;

sending the twice modified update request from the central system to the home network; and

sending an update response to the twice modified update request from the home network to the roaming network via the central system, alliance network, and roaming gateway.

7. The method of claim 6 further comprising:  
placing a call by the subscriber.
8. The method of claim 6 further comprising:  
sending a SMS message by the subscriber.
9. The method of claim 6 further comprising:  
receiving an incoming call for the subscriber by the home network;  
sending a "Provide Roaming Number" request from the home network to the central system;  
sending a "Provide Roaming Number" request from the central system; acting as a home locator register(HLR), to the alliance network;  
sending the "Provide Roaming Number" request from the alliance network to the roaming gateway;  
sending the "Provide Roaming Number" request from the roaming gateway, acting as HLR, to the roaming system;  
sending an provide number response to the "Provide Roaming Number" request from the roaming network to the home network via the roaming gateway, alliance network, and central system; and  
connecting the subscriber to the in coming call.
10. The method of claim 6 further comprising:  
receiving an incoming SMS message for the subscriber by the home network;  
sending a "MT Forward SM" request from the home network to the central system;  
sending a "MT Forward SM" request from the central system, acting as a home locator register(HLR), to the alliance network;

- sending the "MT Forward SM" request from the alliance network to the roaming gateway;

- sending the "MT Forward SM" request from the roaming gateway, acting as HLR to the roaming system;

- delivering the SMS message to the subscriber; and

- sending an SMS response to the "MT Forward SM" request from the roaming network to the home network via the roaming gateway, alliance network, and central system.

11. A method for mobile communication roaming where a subscriber's home network and a roaming network used by the subscriber do not have a roaming agreement, and the home network and the roaming network are connected with a backbone, the method comprising:

- sending a "Send Authentication/Parameters" request from the roaming network to an intelligent roaming system on or attached to the backbone;

- sending the "Send Authentication/Parameters" request from the intelligent roaming system to the home network;

- sending an authentication response to the "Send Authentication/Parameters" request from the home network to the roaming network via the backbone and intelligent roaming system;

- sending an "Update Location" request from the roaming network to the intelligent roaming system;

- replacing the visitor locator register (VLR) address in the "Update Location" request with the VLR address of the intelligent roaming system to create a modified update request;

- sending the modified update request from the intelligent roaming system to the home network; and

- sending an update response to the modified update request from the home network to the roaming network via the backbone and intelligent roaming system.

12. The method of claim 11 further comprising:

- placing a call by the subscriber.

13. The method of claim 11 further comprising:  
sending a SMS message by the subscriber.
14. The method of claim 11 further comprising:  
receiving an incoming call for the subscriber by the home network;  
sending a "Provide Roaming Number" request from the home network to the intelligent roaming system;  
sending a "Provide Roaming Number" request from the intelligent roaming system; acting as a home locator register(HLR), to the roaming network;  
sending an provide number response to the "Provide Roaming Number" request from the roaming network to the home network via the backbone and intelligent roaming system; and  
connecting the subscriber to the in coming call.
15. The method of claim 11 further comprising:  
receiving an incoming SMS message for the subscriber by the home network;  
sending a "MT Forward SM" request from the home network to the intelligent roaming system;  
sending a "MT Forward SM" request from the intelligent roaming system, acting as a home locator register(HLR), to the roaming network;  
delivering the SMS message to the subscriber; and  
sending an SMS response to the "MT Forward SM" request from the roaming network to the home network via the backbone and intelligent roaming system.
16. A method for mobile communication roaming where a subscribers home network and a roaming network used by the subscriber do not have a roaming agreement, and the home network and the roaming network are connected with a backbone, the method comprising:  
replacing the subscribers primary IMSI with a secondary IMSI on a mobile communication device;

sending a "Send Authentication/Parameters" request, based on the secondary IMSI, from the roaming network to an intelligent roaming system on the backbone;

replacing the secondary IMSI with the primary IMSI in the "Send Authentication/Parameters" request;

sending the "Send Authentication/Parameters" request from the intelligent roaming system to the home network;

sending an authentication response to the "Send Authentication/Parameters" request from the home network to the roaming network via the backbone and intelligent roaming system;

sending a "Update Location" request from the roaming network to the intelligent roaming system;

replacing the visitor locator register (VLR) address in the "Update Location" request with the VLR address of the intelligent roaming system to create a modified update request;

sending the modified update request from the intelligent roaming system to the home network; and

sending an update response to the modified update request from the home network to the roaming network via the backbone and intelligent roaming system.

17. The method of claim 16 further comprising:  
placing a call by the subscriber.

18. The method of claim 16 further comprising:  
sending a SMS message by the subscriber.

19. The method of claim 16 further comprising:  
receiving an incoming call for the subscriber by the home network;  
sending a "Provide Roaming Number" request from the home network to the intelligent roaming system;  
sending a "Provide Roaming Number" request from the intelligent roaming system, acting as a home locator register(HLR), to the roaming network;

sending an provide number response to the "Provide Roaming Number" request from the roaming network to the home network via the backbone and intelligent roaming system; and  
connecting the subscriber to the in coming call.

20. The method of claim 16 further comprising:  
receiving an incoming SMS message for the subscriber by the home network;

sending a "MT Forward SM" request from the home network to the intelligent roaming system;

sending a "MT Forward SM" request from the intelligent roaming system, acting as a home locator register(HLR), to the roaming network;

delivering the SMS message to the subscriber; and

sending an SMS response to the "MT Forward SM" request from the roaming network to the home network via the backbone and intelligent roaming system.

21. A method of billing a subscriber for roaming communications services when the subscribers home network and the roaming network do not have a roaming agreement, the method comprising:

rating the communication by the roaming network;

sending a tapout file from the roaming network to a central system settlement house;

consolidating the tapout files by alliance network at the central system settlement house;

sending the consolidated tapout files to the respective alliance network;

regenerating the tapout file at the alliance network; and

sending the regenerated tapout file from the alliance network to the appropriate home network.

22. A method of billing a subscriber for roaming communications services when the subscribers home network and the roaming network do not have a roaming agreement, the method comprising:

rating the communication by the roaming network;



sending a tapout file from the roaming network to an alliance network;  
consolidating the tapout files at the alliance network settlement house;  
sending the consolidated tapout files to the central system;  
translating the secondary IMSI to the primary IMSI  
regenerating the tapout file at the central system; and  
sending the regenerated tapout file from the central system to the appropriate home network.

23. A method of billing a subscriber for roaming communications services when the subscribers home network and the roaming network do not have a roaming agreement, the method comprising:

rating the communication by the roaming network;  
sending a tapout file from the roaming network to a central system settlement house;  
consolidating the tapout files by home network at the central system settlement house; and  
sending the consolidated tapout files to the respective home network;

24. A method of billing a subscriber for roaming communications services when the subscribers home network and the roaming network do not have a roaming agreement, the method comprising:

rating the communication by the roaming network;  
sending a tapout file from the roaming network to an intelligent roaming system;  
translating the secondary IMSI to the primary IMSI  
regenerating the tapout file at the intelligent roaming system; and  
sending the regenerated tapout file from the intelligent roaming system to the appropriate home network.